

US EPA ARCHIVE DOCUMENT

The background features a large, faint, circular watermark of the United States Environmental Protection Agency (EPA) seal. The seal contains a stylized flower with three leaves and a sun-like shape above it. The words "UNITED STATES" are at the top and "ENVIRONMENTAL PROTECTION AGENCY" are at the bottom of the circle.

EPA Dairy Inspections in the Shenandoah Valley

April 19, 2011



Outline

- Why is EPA looking at farms in the Shenandoah Valley?
- What activities is EPA doing in the Valley?
- What happens during an EPA inspection?
- What follow-up actions occur after an EPA inspection?



Why is EPA looking at farms in the Shenandoah Valley?

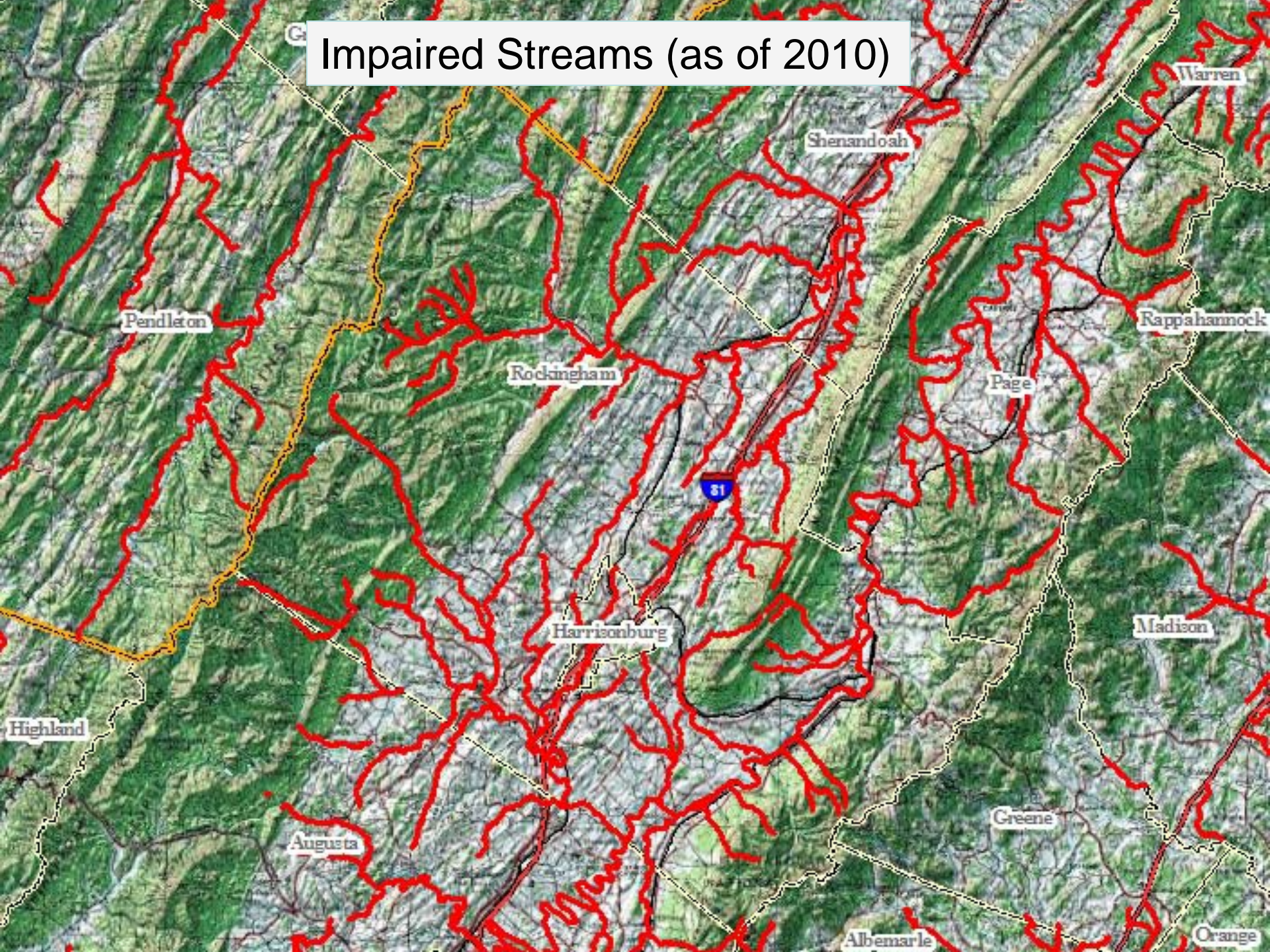
- Local Water Quality
- Chesapeake Bay



Local Water Quality

- Local streams impairments

Impaired Streams (as of 2010)





Local Water Quality

- Local stream impairments
- Smallmouth bass fish kills
 - Large fish kill in 2005
 - Smaller fish kills since then
 - Loss of 2,100 anglers from 2004 to 2005*

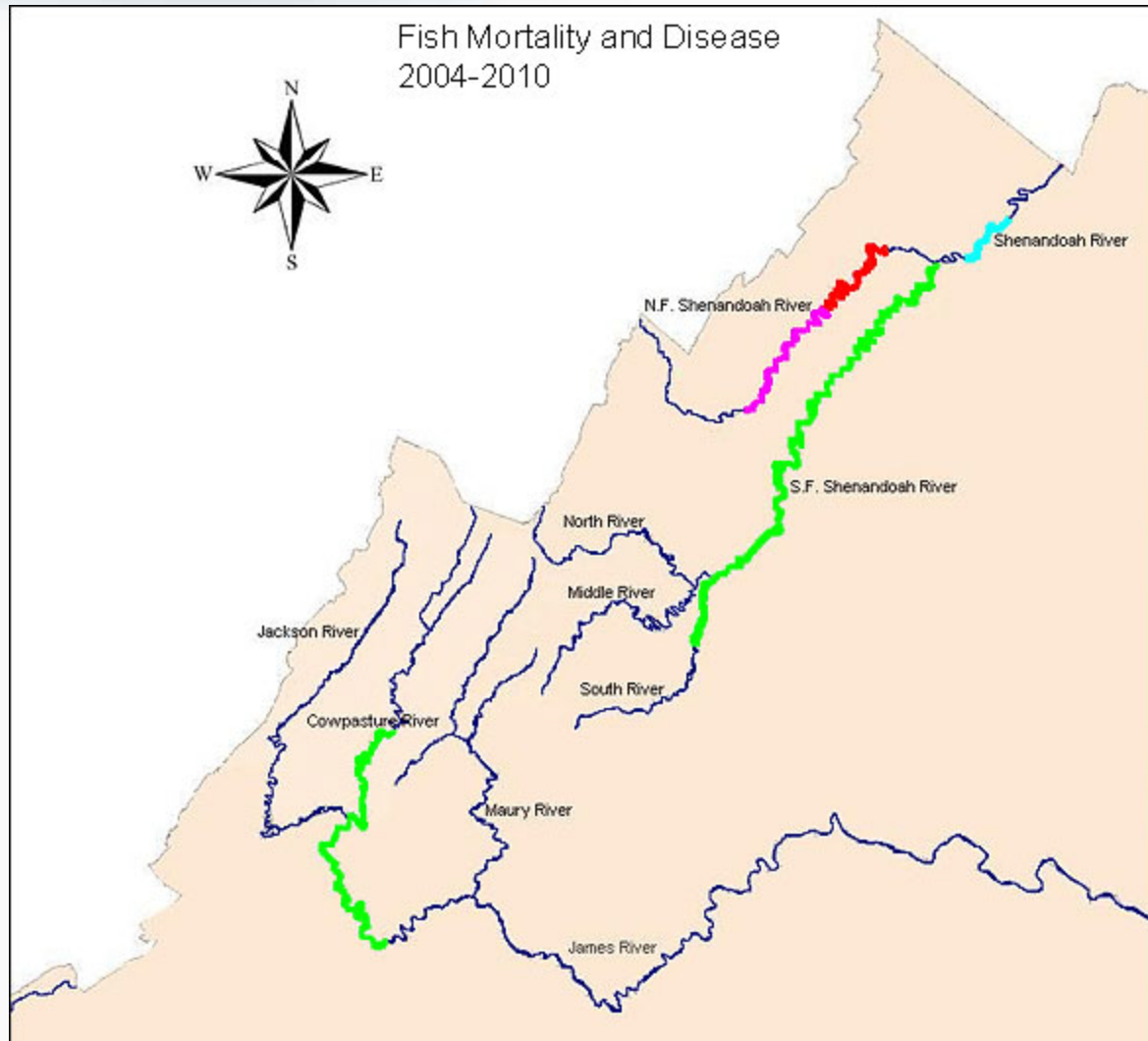


Figure 1. Location of fish mortality and disease events 2004-2009.



Local Water Quality

- Local stream impairments
- Smallmouth bass fish kills
- **Intersex fish**



Local Water Quality

- Local stream impairments
- Smallmouth bass fish kills
- Intersex fish
- **Drinking water impacts**



Drinking water impacts

- Karst topography of limestone/dolomite
 - Sinkholes, sinking and losing streams, caves, and large flow springs
 - Groundwater & surface water intimately connected
 - Contaminants can enter groundwater quickly with little or no filtration



Drinking water impacts

- Watson Run (Lancaster County, PA)
 - Sampled 19 farm wells
 - 8 out of 19 contained Total coliform bacteria
 - 5 out of 19 contained E. coli bacteria
 - 16 out of 19 had $>10\text{mg/L}$ for nitrate
 - 3 systems that didn't had nitrate treatment



Drinking water impacts

- Human health
 - Bacteria
 - Stomach illness, other illness, death
 - Nitrates
 - Blue Baby Syndrome
 - Infants from 0 to 4 months old
 - Bluish skin around eyes and mouth
 - Can be treated if caught soon enough
 - Pregnant women can pass to developing fetus
 - Can affect the sick or elderly



Drinking water impacts

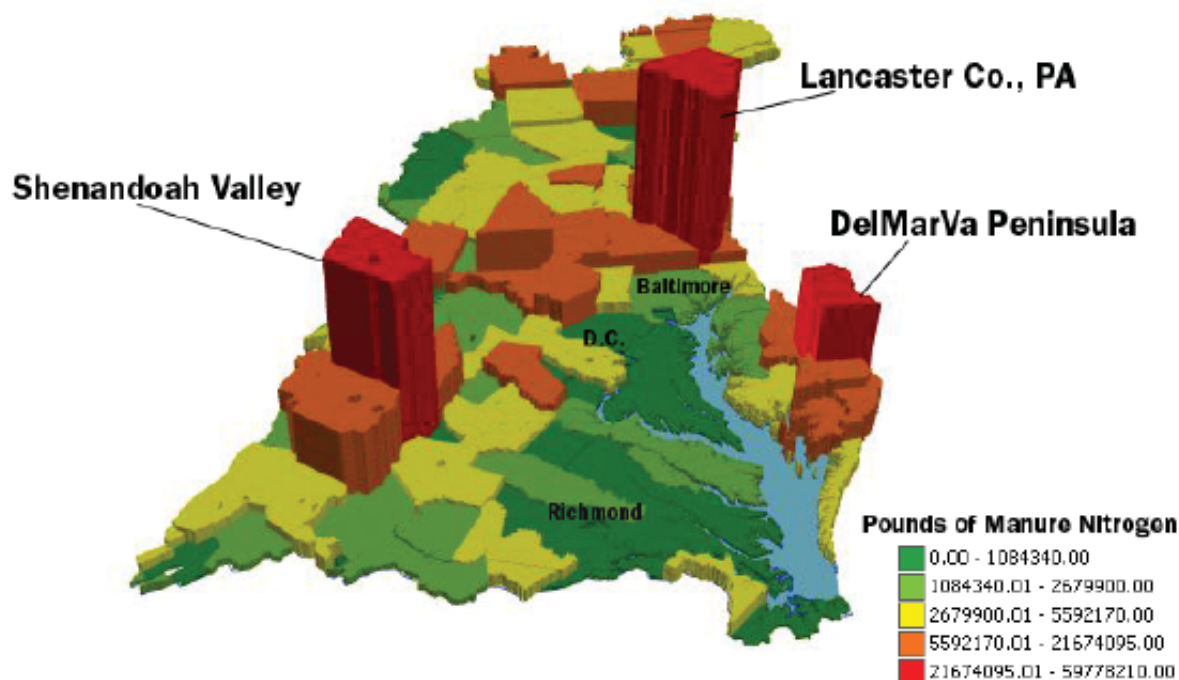
- Human health
- Animal health
 - “Although usually acute, the effects of nitrite or nitrate toxicity may be subacute or chronic and are reported to include retarded growth, lowered milk production, vitamin A deficiency, abortions and fetotoxicity, and increased susceptibility to infection.” (The Merck Veterinary Manual)
 - In Watson Run, nitrate contamination led to mastitis, still-births and lower milk production.



Chesapeake Bay

- There are 3 agricultural “hot spots” in the Chesapeake Bay watershed
 - Delmarva
 - Southcentral Pennsylvania
 - Shenandoah Valley

Total Manure Nitrogen in Chesapeake Bay Watershed Counties



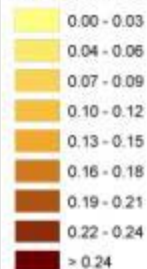
Source: EPA Chesapeake Bay Program

Agricultural Sources of Total Phosphorus

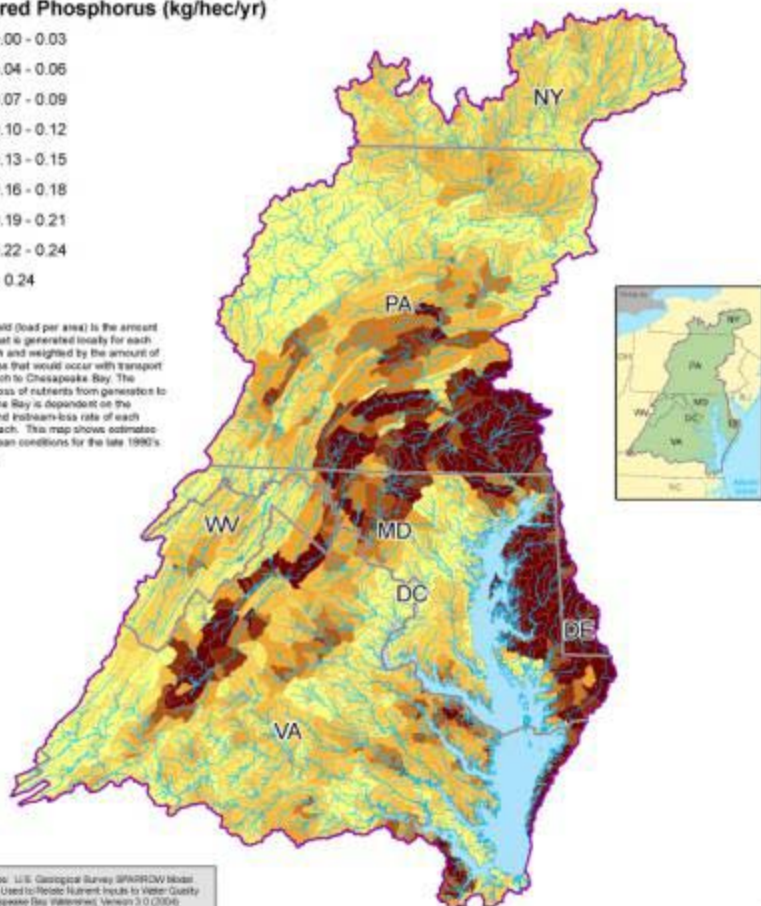
Delivered Yield to the Chesapeake Bay



Delivered Phosphorus (kg/hect/yr)



Delivered yield (load per area) is the amount of nutrient that is generated locally for each stream reach and weighted by the amount of in-stream loss that would occur with transport from the reach to Chesapeake Bay. The cumulative loss of nutrients from generation to delivery to the Bay is dependent on the travel time and in-stream loss rate of each individual reach. This map shows estimates based on mean conditions for the late 1990's time period.



Data Sources: U.S. Geological Survey SPARROW Model
Digital Data Used to Rotate Nutrient Inputs to Water Quality
in the Chesapeake Bay Watershed, Version 2.0 (2004)
(<http://md.water.usgs.gov/pubs/atlantis/atlantis.html>)

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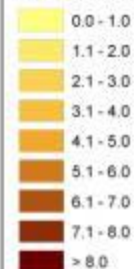
UTM Zone 18N, NAD 83

Agricultural Sources of Total Nitrogen

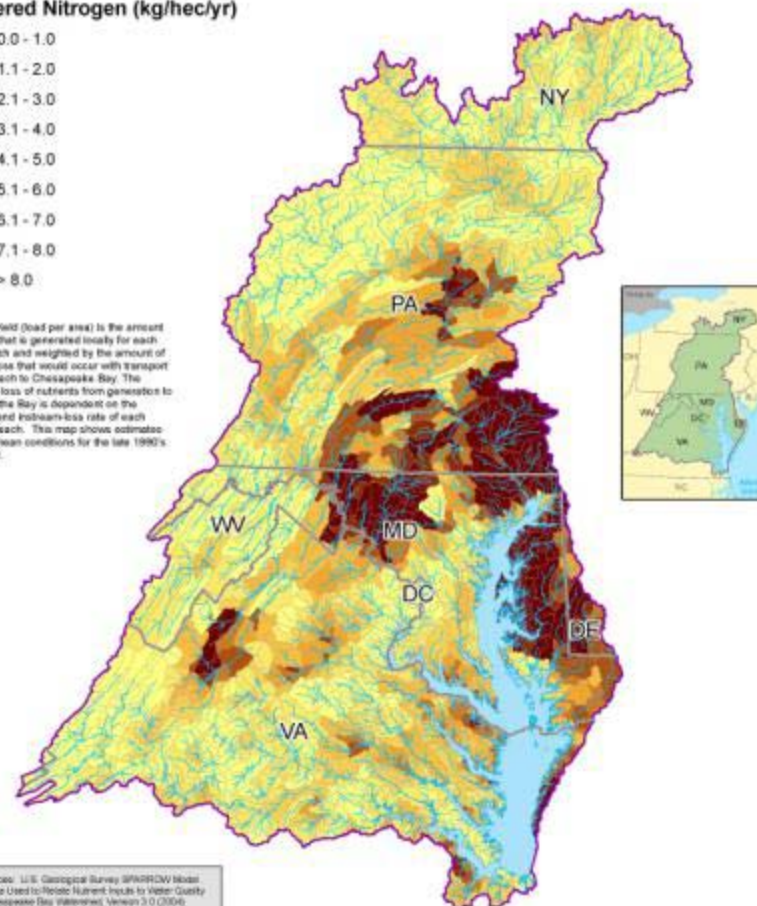
Delivered Yield to the Chesapeake Bay



Delivered Nitrogen (kg/hect/yr)



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UTM Zone 18N, NAD 83



What activities is EPA doing in the Valley?

- Conducting evaluations of farms and surface and ground water impact
- Follow-up actions as appropriate
- Working with state agencies (VA DEQ/VA DCR/VDACS) in determining appropriate follow-up actions
- Talking to agricultural industry, trade groups, community leaders



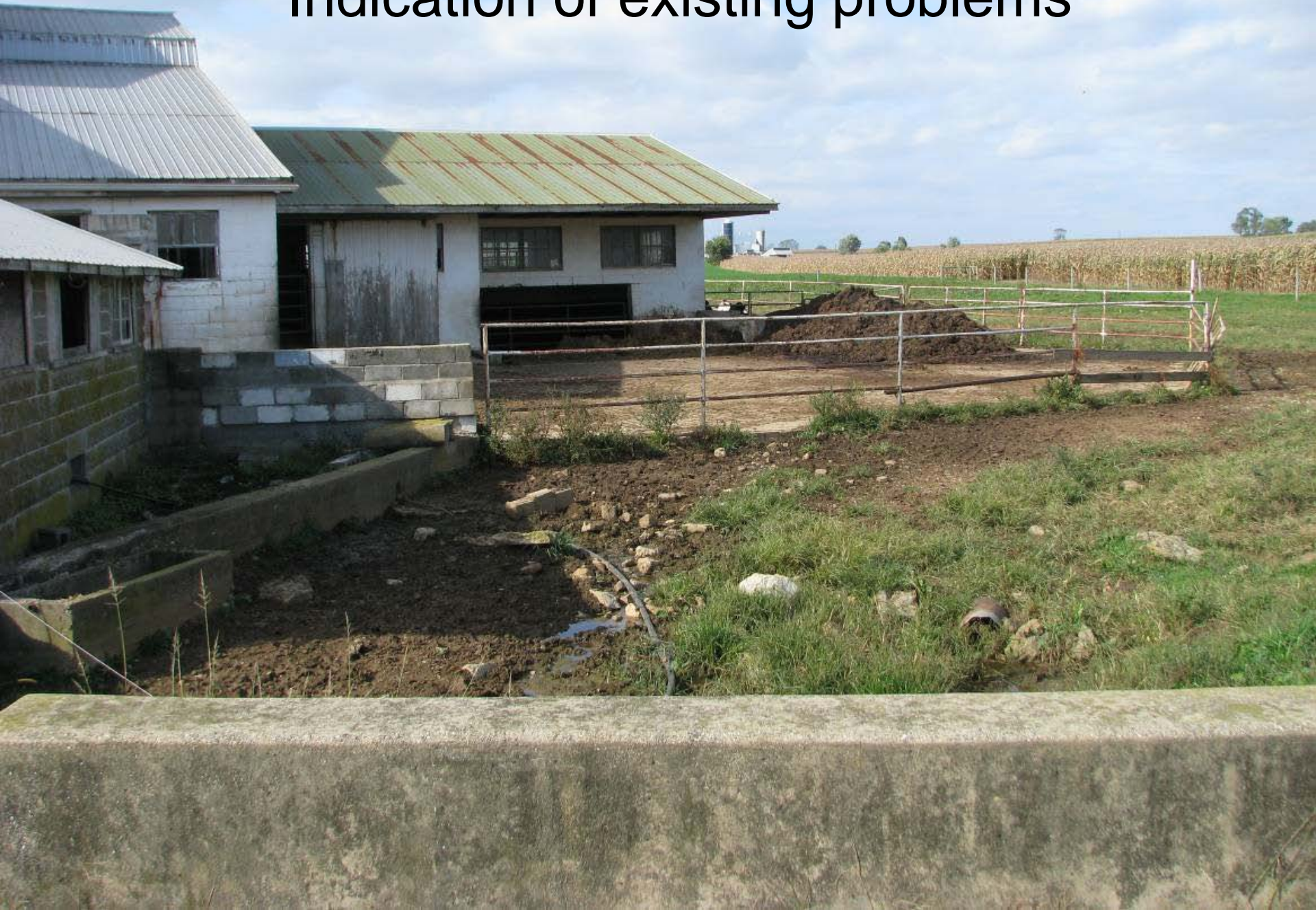
How does EPA decide which farms to visit?

- EPA looks at criteria such as:
 - Proximity to surface waters
 - Indications that there are problems
 - Whether farms are in existing regulatory program

Proximity to surface waters



Indication of existing problems



Indication of existing problems





Existing Regulatory Programs

- Virginia Pollution Abatement (VPA) program
 - Need VPA Permit if >200 dairy cows or >300 cattle and have liquid manure storage
 - EPA's past evaluations indicate that the VPA program is an effective program
 - VPA inspection program is effective
 - There is likely no need for a federal evaluation if you have a VPA permit



What happens during an EPA inspection?



Inspection Outline

- Pre-Inspection
- During Inspection
 - Compliance with Regulatory Requirements
 - Potential types of discharges
 - BMPs
- End of Inspection
- Post-Inspection



Pre-Inspection

- Coordinate with VADEQ/VDACS
- Contact state vets to see if any disease outbreaks in the area
- Farmer usually notified 24-48 hours in advance
- Ask about appropriate biosecurity procedures for farm



During Inspection

- Disinfect vehicle wheels/ boots before coming onto farm
- Present credentials and identify authority to inspect farm (CWA §308)
- Identify farms visited in previous 48 hours
- Explain purpose of farm visit



During Inspection

- Discuss farm operations
 - Animal numbers, location of animals on-site, crops and land application, implemented BMPs
- Conduct walk-through of facility and take photos
 - Avoid entering animal containment areas as much as possible
- Collect samples as appropriate
 - Manure, soil, surface water, ground water



During Inspection

- What is EPA looking for during an inspection?
 - Ensuring that there are no surface or groundwater impacts – Is there a discharge?
 - Compliance with state/federal laws
 - VPDES Permit if discharging
 - VPA Permit if >200 dairy cows or >300 cattle
 - Compliance with Nutrient Management Plan
 - BMPs being implemented



During Inspection

- What is a discharge?
 - Addition of pollutants to waters of the United States from any point source
 - The farm in its entirety may be considered a point source, not just a pipe on the farm.
 - Includes 1) surface runoff which is collected or channelized and 2) discharges through pipes , sewers, or other conveyances



Examples of Potential Types of Discharges

- Runoff from denuded lots

Denuded lot near surface water

Surface waters





Examples of Potential Types of Discharges

- Runoff from denuded lots
- Manure stockpiles



**Manure stockpile
discharging to
surface waters
150 ft away**



Examples of Potential Types of Discharges

- Runoff from denuded lots
- Manure stockpiles
- Milk parlor washwater

Milk parlor washwater discharge pipe





Examples of Potential Types of Discharges

- Runoff from denuded lots
- Manure stockpiles
- Milk parlor washwater
- **Improper mortality management**

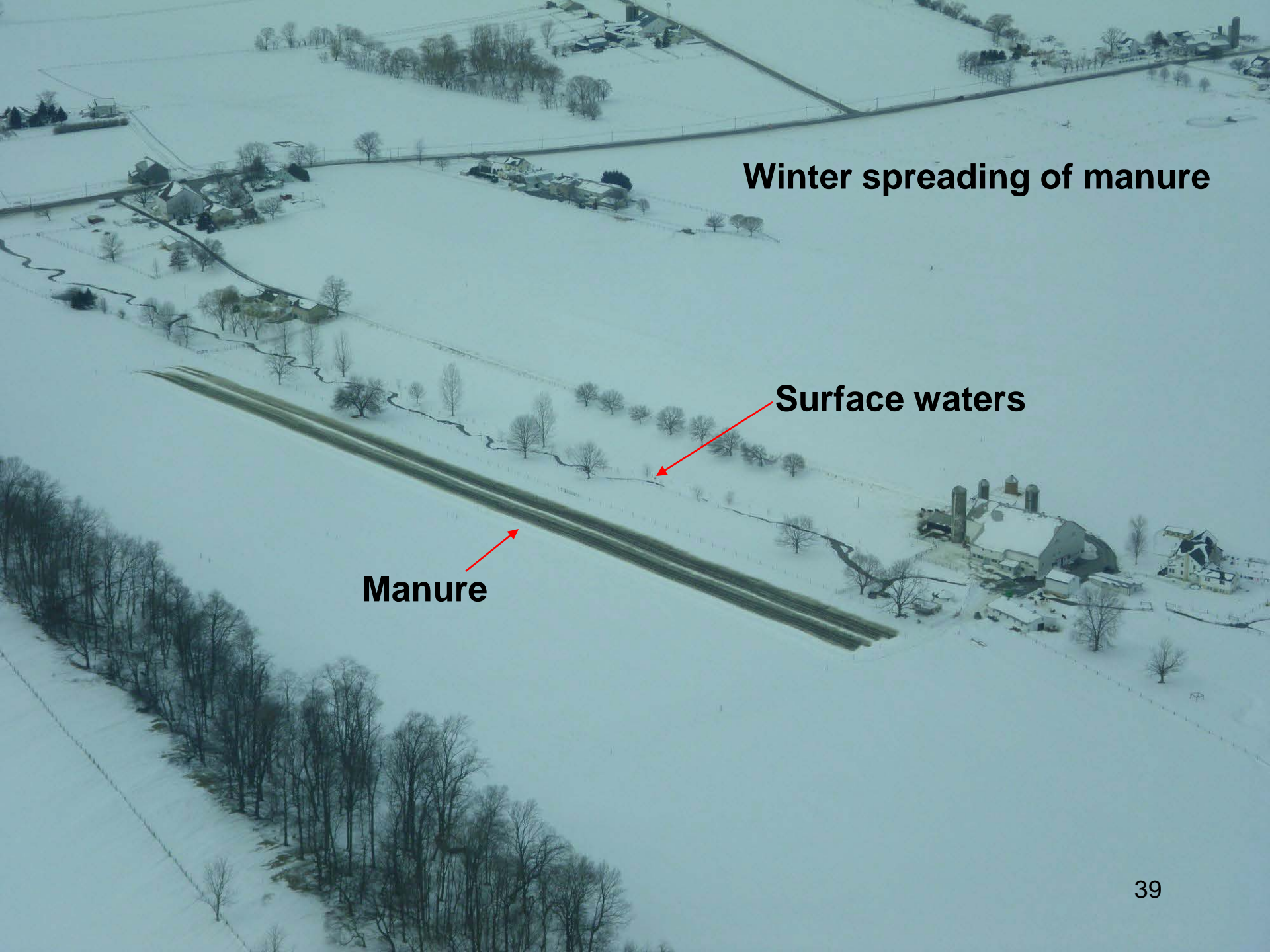
Improper burial





Examples of Potential Types of Discharges

- Runoff from denuded lots
- Manure stockpiles
- Milk parlor washwater
- Improper mortality management
- Winter spreading of manure



Winter spreading of manure

Surface waters

Manure



During Inspection

- What are some BMPs that EPA looks for?



During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning



During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning
 - Stream fencing

Top of bank stream fencing



Stream fencing





During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning
 - Stream fencing
 - Vegetative buffers

Vegetative buffer



Vegetative buffer





During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning
 - Stream fencing
 - Vegetative buffers
 - Cover crops





During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning
 - Stream fencing
 - Vegetative buffers
 - Cover crops
 - Conservation tillage



During Inspection

- What are some BMPs that EPA looks for?
 - Nutrient Management Planning
 - Stream fencing
 - Vegetative buffers
 - Cover crops
 - Conservation tillage
 - Clean water diversion

Roof gutters keep clean storm water away from animal confinement areas and manure storage areas





End of Inspection

- Discuss any areas of concern
- Leave EPA contact information for farmer
- Disinfect boots or discard boot covers
- Disinfect vehicle wheels after exiting property
- Pressure wash vehicle



Post-Inspection

- Follow-up actions

Questions for EPA or VA?

